Enroute Modeling –
Or How I came to be at the FAA

Steve Bradford

From the announcement

- Considering - Additional modeling complexities include:
  - where to take en route sector capacity delay - reroutes versus en route "metering" versus holding aircraft on the ground
  - convective weather
  - interaction with terminal areas
- SOME THOUGHTS

Back to the 80's

- AIRSIM – before even my time but embedded into SIMMOD
- SIMMOD – User, developer, sponsor, …
- NASPAC – User, sponsor, kibitzer
- TAAM - Reviewer
- RAMS – User, sponsor of add-ons, kibitzer
- FASTSIM - Sponsor
- Add-Ons – sponsor, designer

What do they model?

- Two classes
  - Aircraft on Aircraft
  - Aircraft on Resource
- Occasionally have aircraft on controller
  - RAMS
  - Mini-Midas added to Fast-time
- Sometimes we have aircraft on sector
  - SIMMOD – limited
  - NASPAC – limited

Challenge

- Excerpts from the report

  Comparison of US and European Airports and Airspace to Support Concept Validation

  Sponsored By:

  The R&D FAA/EUROCONTROL Committee

  Action Plan 2

From the Executive Summary

- In the en-route airspace the similarities seem to outweigh differences, although the study did not look at staffing aspects. <u>There is no great difference in throughput or procedures for sectors where it seems that "best current practice" are fully used in both Europe and US.</u> When coupled with the airport results, this indicates that both systems are not diametrically different. <u>It is only when traffic flow and its management and specific, specialized sector/practices are considered that conclusions can be drawn.</u> …

Excerpt continued - 1

- Differences may be best explained by how ATC developed and adapted to traffic conditions and external events. <u>In particular, it was important to consider why at the strategic flow level the Europeans opted for the CFMU versus the apparently more ad hoc system used in the US.</u>

Excerpt continued - 2

- This led to examine the traffic flow management objectives and the processes employed to meet these objectives…It is when the impact of the overall traffic flow was considered that it became clear why some decisions are made over others. <u>It is the flow options available to meet demand that need investigation. It is the scope of information and span of influence of the individual ATM components that begins to provide insight into existing and future concepts.</u>

Excerpt continued - 3

- It is recognised that in the gate to gate perspective the network effect is linking all decisions from departure to destination and the attempts to <u>choreograph the mass of flights into an efficient aggregate.</u>

Excerpt continued - 4

- The comparison has contributed to an original understanding of concept, services and performance, as well as their interrelationship. Although it has not addressed all issues in all detail, <u>it also provides the context for further mutually defining the future global ANS concept and overcome the present shortcomings</u>

spacing for EWR!

IAD

DCA

How inefficient is this from a system perspective?